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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,482	09/25/2001	Tatsuya Hojo	6790P359	4802

7590 03/21/2005

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EXAMINER	
CRAIG, DWIN M	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/857,482	HOJO ET AL.	
	Examiner	Art Unit	
	Dwin M Craig	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4 and 10* is/are rejected.

7)☒ Claim(s) *3, 5, 6, 7, 8, 9, 11, 12 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 September 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1 June 2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-13 have been presented for Examination.

Priority

2. The Examiner acknowledges the Applicant's claim of priority to Japanese Laid Open Patent Application Number 283978/1999 filed 10/05/1999 and Japanese Laid Open Patent Application 283981/1999 filed 10/05/1999 and PCT/JP00/06898 filed 10/04/2000.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: *"An H-Infinity Controller Design using Control Object Models"*.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Independent **Claim 1** and dependent **Claims 4 and 10** are rejected under 35 U.S.C. 103(b) as being anticipated by ""**New Identification based weighted H∞ norm approximation**

scheme and its applications to controller reduction" by D. Kavaranoglu, S. Al-Amer and M. Bettayeb, hereafter referred to as the *Kavaranoglu et al.* reference.

4.1 As regards independent **Claim 1** the *Kavaranoglu et al.* reference teaches an H-Infinity controller using logic employing generalized plants with response characteristics of a closed loop system **(page 61),** a calculation means for calculating the parameters in accordance with the response characteristics of a model **(page 62** *"To obtain the solution of the H∞ model reduction problem, the following algorithm, which is motivated from Lawson's algorithm was proposed in [25, 26] In the frequency-domain:"***),** and a storage means is inherent to the *Kavaranoglu et al.* reference because these method lend themselves to use on a digital computing system.

4.2 As regards dependent **Claims 4 and 10** the *Kavaranoglu et al.* reference teaches variable weight and a frequency response determining means **(pages 62 & 63).**

5. Independent **Claim 1** and dependent **Claims 2, 4 and 10** are rejected under 35 U.S.C. 102(b) as being anticipated by **"A mixed optimization approach to multiobjective computer-aided control system design"** by J.F. Whidborne, I Postwait and D-W Gu, hereafter referred to as the *Whidbborne et al.* reference.

5.1 As regards independent **Claim 1** the *Whidborne et al.* reference teaches, a design device for designing a controller in accordance with the H infinity control logic **(Abstract page 309),** employing generalized plants having control object models for manipulation of variables **(figure 9 page 314),** storage means is inherent, (note the MATLAB program running on a computer **page 309),** parameter calculation means using an object model to determine the

response characteristics of a closed loop system **(Figure 5 page 313** box titled, "compute closed loop transfer functions"**),** and a controller calculation means for calculating parameters for the generalized plants in said storage means **(Figure 3 Page 312, Figure 7 page 314).**

5.2 As regards dependent **Claims 2, 4 and 10** the *Whidborne et al.* reference teaches, variable weight adjusting means **(Figure 9 page 314),** frequency response calculation means **(Figure 4 page 313** *it is noted by the Examine that Figure 4 discloses bandwidth of the charted function, frequency bandwidth is a figure of merit when determining the frequency response of a given function*), and a scaling matrix **(page 311).**

6. Independent **Claim 1** and dependent **Claims 2, 4 and 10** are rejected under 35 U.S.C. 102(b) as being anticipated by **"Uncertainty Weight Selection for H-Infinity and Mu-Control Methods"** by P. Lunstrom, S. Skogestad and Z. Wang hereafter referred to as the *Lunstrom* reference.

6.1 As regards independent **Claim 1** the *Lunstrom et al.* reference teaches, a design device for designing a controller in accordance with the H infinity control logic **(Abstract page 1537),** employing generalized plants having control object models for manipulation of variables **(page 1538 section "Controller Designs"),** storage means is inherent **(page 1538** note the footnote at the bottom of the page describing MATLAB which is a computer program which stores data objects in memory, thus a storage means**),** parameter calculation means using an object model to determine the response characteristics of a closed loop system **(Figure 1 page 1537** it is noted by the Examiner that Figure 1 in the *Lunstrom et al.* reference is almost identical to Figure 7 in the Applicant's specification, as regards the frequency response characteristics see

Figure 5 page 1541), and a controller calculation means for calculating parameters for the generalized plants in said storage means **(page 1542 figures 7 & 8** inherently show the results of a parameter calculation means**).**

6.2 As regards dependent **Claims 2, 4 and 10** the *Lunstrom et al.* reference discloses a variable weight and a matrix **(page 1537).**

7. Independent **Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by **Hartly SIR number H1410.**

7.1 As regards independent **Claim 1** the *Hartly* reference teaches, a design device for designing a controller in accordance with the H infinity control logic **(Figure 1 Item 12),** employing generalized plants having control object models for manipulation of variables **(Figure 2),** storage means is inherent, **(Col. 2 lines 27-57** discloses the use of MATLAB**),** parameter calculation means using an object model to determine the response characteristics of a closed loop system **(Figure 3, Col. 3 Lines 50-53),** and a controller calculation means for calculating parameters for the generalized plants in said storage means **(Col. 4 lines 34-54).**

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

8. Independent **Claim 1** and dependent **Claims 2, 4 and 10** are rejected under 35 U.S.C. 102(a) as being anticipated by **Shah U.S. patent 6,230,062.**

8.1 As regards independent **Claim** 1 the Shah reference teaches, a design device for designing a controller in accordance with the H infinity control logic **(Figure 3B items 332 & 331),** employing generalized plants having control object models for manipulation of variables

(Figure 3C, Figure 6 "Parametric Adaptation"), a storage means **(Col. 6 Lines 24-40),** parameter calculation means using an object model to determine the response characteristics of a closed loop system **(Col. 6 Lines 13-23),** and a controller calculation means for calculating parameters for the generalized plants in said storage means **(Col. 9 Lines 32-40** note the term "computing resources" which is functionally equivalent to a "calculation means")**.**

8.2 As regards dependent **Claims 2, 4 and 10,** the *Shah* reference teaches weighting **(Col. 11 Lines 45-55),** and a matrix **(Col. 11 Lines 20-45).**

Allowable Subject Matter

9. Dependent **Claims 3, 5, 6, 7, 8, 9, 11, 12, and 13** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Claims 1-13 have been presented for Examination. **Claims 1, 2, 4 and 10** have been rejected. **Claims 3, 5, 6, 7, 8, 9, 11, 12 and 13** have been objected to. This Action is **Non-Final.**

10.1 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on (571) 272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMC